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CENTRAL FAX CENTERApplication Serial No. 10/572,725
Reply to final office action of March 31, 2009**MAY 26 2009****PATENT**
Docket: CU-4700**Amendments to the Claims**

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) An RF front-end transceiver comprising: ~~a frequency synthesizer or a base band processor providing a digital frequency control voltage (VDT) signal and an analog frequency control voltage (VAT) signal wherein the frequency synthesizer or a base band processor comprises: a phase frequency detector (PFD) receiving a reference frequency (f_{REF}) signal and an N-divider frequency (f_{DIV}) signal; a current pump (CP) operatively coupled to the PFD; a low pass filter (LPF) operatively coupled to the CP wherein the LPF provides the VAT signal; a digital tuner (DT) operatively coupled to the CP and to the LPF such that the DT and LPF are parallel to each other wherein the DT provides the VDT signal; a digital analog tuning voltage controlled oscillator (DAT-VCO) operatively coupled to the LPF and to the DT wherein the DAT-VCO providing a resonant frequency (f_{LO}) signal, a f_{VCO} signal and the f_{DIV} signal in response to the VAT and VDT signals, the DAT-VCO outputting the f_{LO} such that a frequency of the f_{LO} is controlled by the VAT and VDT signals; and an N divider receiving the f_{VCO} signal from the DAT-VCO and transmitting the f_{REF} to the PFD; a receive amplifier for amplifying and outputting a receive RF signal such that a frequency of the receive RF signal from the receive amplifier is controlled by the VAT and VDT signals; a receive mixer for mixing the receive RF signal amplified and the f_{LO} signal to convert the receive RF signal into a receive base band signal such that a frequency of the receive base band signal from the receive mixer is controlled by the VAT and VDT signals; a transmit mixer for mixing a transmit base band signal and the f_{LO} signal to convert the transmit base band signal into a transmit RF signal such that a frequency of the transmit RF signal from the transmit mixer is controlled by the VAT and VDT signals; and a transmit amplifier for amplifying and outputting the transmit RF signal such that a frequency of the transmit RF signal from the transmit amplifier is controlled by the VAT and VDT signals, wherein resonant frequencies of the DAT-VCO, the~~

Application Serial No. 10/572,725
Reply to final office action of March 31, 2009

PATENT
Docket: CU-4700

~~receive amplifier, the receive mixer, the transmit mixer and the transmit amplifier are all controlled by the VAT and VDT signals so that a maximum power can be transmitted even when a band of the f_{REF} signal is changed~~

a frequency synthesizer or a base band processor for providing a digital frequency control voltage (VDT) signal and an analog frequency control voltage (VAT) signal;

an oscillator for outputting a resonant frequency signal such that a frequency of the resonant frequency signal is controlled by the VDT signal and the VAT signal;

a receive amplifier for amplifying and outputting a receive RF signal;

a receive mixer for mixing the receive RF signal amplified and the resonant frequency signal to convert the receive RF signal into a receive base band signal;

a transmit mixer for mixing a transmit base band signal and the resonant frequency signal to convert the transmit base band signal into a transmit RF signal; and

a transmit amplifier for amplifying and outputting the transmit RF signal, wherein at least one of the receive amplifier, the receive mixer, the transmit mixer and the transmit amplifier includes a resonant unit, the resonant unit being controlled by only the VDT signal or by both the VDT signal and the VAT signal.

2. (canceled)

3. (currently amended) An RF front-end receiver comprising: ~~a frequency synthesizer or a base band processor providing a digital frequency control voltage (VDT) signal and an analog frequency control voltage (VAT) signal wherein the frequency synthesizer or a base band processor comprises: a phase frequency detector (PFD) receiving a reference frequency (f_{REF}) signal and an N-divider frequency (f_{DIV}) signal; a current pump (CP) operatively coupled to the PFD; a low pass filter (LPF) operatively coupled to the CP wherein the LPF provides the VAT signal; a digital tuner (DT) operatively coupled to the CP and to~~

Application Serial No. 10/572,725
Reply to final office action of March 31, 2009

PATENT
Docket: CU-4700

~~the LPF such that the DT and LPF are parallel to each other wherein the DT provides the VDT signal; a digital analog tuning voltage controlled oscillator (DAT-VCO) operatively coupled to the LPF and to the DT wherein the DAT-VCO providing a resonant frequency (f_{LO}) signal, a f_{VCO} signal and the f_{DIV} signal in response to the VAT and VDT signals, the DAT-VCO outputting the f_{LO} such that a frequency of the f_{LO} is controlled by the VAT and VDT signals; and an N divider receiving the f_{VCO} signal from the DAT-VCO and transmitting the f_{REF} to the PFD; a receive amplifier for amplifying and outputting a receive RF signal such that a frequency of the receive RF signal from the receive amplifier is controlled by the VAT and VDT signals; and a receive mixer for mixing the receive RF signal amplified and the f_{LO} signal to convert the receive RF signal into a receive base band signal such that a frequency of the receive base band signal from the receive mixer is controlled by the VAT and VDT signals, wherein resonant frequencies of the DAT-VCO, the receive amplifier and the receive mixer are all controlled by the VAT and VDT signals so that a maximum power can be transmitted even when a band of the f_{REF} signal is changed~~

a frequency synthesizer or a base band processor for providing a digital frequency control voltage (VDT) signal and an analog frequency control voltage (VAT) signal;

an oscillator for outputting a resonant frequency signal such that a frequency of the resonant frequency signal is controlled by the VDT signal and the VAT signal;

a receive amplifier for amplifying and outputting a receive RF signal; and

a receive mixer for mixing the receive RF signal amplified and the resonant frequency signal to convert the receive RF signal into a receive base band signal; wherein at least one of the receive amplifier and the receive mixer includes a resonant unit, the resonant unit being controlled by only the VDT signal or by both the VDT signal and the VAT signal.

4-7. (canceled)

Application Serial No. 10/572,725
Reply to final office action of March 31, 2009

PATENT
Docket: CU-4700

8. (currently amended) An RF front-end transmitter comprising: ~~a frequency synthesizer or a base band processor providing a frequency control (FC) signal wherein the frequency synthesizer or a base band processor comprises: a phase frequency detector (PFD) receiving a reference frequency (f_{REF}) signal and an N-divider frequency (f_{DIV}) signal; a current pump (CP) operatively coupled to the PFD; a low pass filter (LPF) operatively coupled to the CP wherein the LPF provides the VAT signal; a digital tuner (DT) operatively coupled to the CP and to the LPF such that the DT and LPF are parallel to each other wherein the DT provides the VDT signal; a digital analog tuning voltage controlled oscillator (DAT-VCO) operatively coupled to the LPF and to the DT wherein the DAT-VCO providing a resonant frequency (f_{LO}) signal, a f_{VCO} signal and the f_{DIV} signal in response to the VAT and VDT signals, the DAT-VCO outputting the f_{LO} such that a frequency of the f_{LO} signal is controlled by the VAT and VDT signals; and an N-divider receiving the f_{VCO} signal from the DAT-VCO and transmitting the f_{REF} to the PFD; a transmit mixer for mixing a transmit base band signal and the f_{LO} signal to convert the transmit base band signal into a transmit RF signal such that a frequency of the transmit RF signal from the transmit mixer is controlled by the VAT and VDT signals; and a transmit amplifier for amplifying and outputting the transmit RF signal such that a frequency of the transmit RF signal from the transmit amplifier is controlled by the VAT and VDT signals, wherein resonant frequencies of the DAT-VCO, the transmit mixer and the transmit amplifier are all controlled by the VAT and VDT signals so that a maximum power can be transmitted even when a band of the f_{REF} signal is changed.~~

a frequency synthesizer or a base band processor for providing a digital frequency control voltage (VDT) signal and an analog frequency control voltage (VAT) signal;

an oscillator for outputting a resonant frequency signal such that a frequency of the resonant frequency signal is controlled by the VDT signal and the VAT signal;

a transmit mixer for mixing a transmit base band signal and the resonant frequency signal to convert the transmit base band signal into a transmit RF

Application Serial No. 10/572,725
Reply to final office action of March 31, 2009

PATENT
Docket: CU-4700

signal; and

a transmit amplifier for amplifying and outputting the transmit RF signal,
wherein at least one of the transmit mixer and the transmit amplifier includes a
resonant unit, the resonant unit being controlled by only the VDT signal or by
both the VDT signal and the VAT signal.

9-20. (canceled)